IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of William D. Picking, et al. Art Unit 1645
Serial No. 09/830,026
Filed October 20, 2001
Confirmation No. 9340
For METHOD FOR THE PRODUCTION OF PURIFIED INVASIN PROTEIN AND USE THEREOF
Examiner Sarvamangala Devi

August 10, 2006

LETTER TO PATENT AND TRADEMARK OFFICE

TO THE COMMISSIONER FOR PATENTS,
SIR:

This letter is in response to the Office action dated July 10, 2006 in which an election was required between the following groups:

Group I (claims 107-108, 110-111, 114-115, 117-118, and 121-122) drawn to a method for the production of a purified recombinant invasion protein (SipC) comprising the amino acid sequence of SEQ. ID. NO. 1; and

Group II (claims 107-108, 110-111, 114-115, 117-118, and 121-122) drawn to a method for the production of a purified recombinant invasion protein (IpaC) comprising the amino acid sequence of SEQ. ID. NO. 2.

Claims 13-18, 21-22, 25, 101-106, 109, 112-113, 116, and 119-120 have been identified as linking claims that will be joined with either of Group I or Group II if elected.

The Office has stated that Groups I and II are not linked so as to form a single general inventive concept under PCT Rule 13.1 and 13.2. Applicants respectfully disagree. Initially, it is noted that the pending claims are directed to methods for the production of a purified recombinant invasion protein; the IpaC and SipC proteins are two products that may be obtained using the claimed methods. The methods used to produce SipC and IpaC proteins, however, vary only in the polynucleotide sequence used. Consequently, the general inventive concept linking Groups I and II lies not in the structure of SEQ. ID. NO. 1 (SipC) or SEQ. ID. NO. 2 (IpaC), but rather in the claimed methods, which are generic to the production of SipC and IpaC. More particularly, as

noted on page 8 in the specification, the claimed methods achieve a high degree of purity of IpaC and similar invasion proteins by using a unique combination of affinity purification in the presence of a denaturant, followed by rapid removal of the denaturant. Groups I and II are thus linked by a single general inventive concept, and should be rejoined.

Furthermore, with regard to search burden the Office has stated that a structural or sequence search for SEQ. ID. NO. 1 and SEQ. ID. NO. 2 would not be co-extensive, because the two sequences lack a sharing of significant structural elements. Applicants note that SEQ. ID. NO. 1 is the native amino acid sequence of the SipC protein of *Salmonella typhimurium*, and SEQ. ID. NO. 2 is the native amino acid sequence of the IpaC protein of *Shigella flexneri*.[1] In contrast to the Office's assertion, there are significant structural and functional similarities between these two sequences. For instance, applicants direct the Office's attention to page 3, lines 17-18 of the Specification, which states "The invasive strains of the *Salmonella* bacteria carry a chromosomal gene which encodes proteins with remarkable similarity to the invasins of *Shigella*." Furthermore, Table 1 on pages 3-5 of the Specification illustrates the significant homology between SipC and IpaC, showing both points of complete identity and conservative amino acid substitutions. Applicants further note that both SipC and IpaC are recognized for secretion by type III secretion systems, are required for entry of *Slamonella* and *S. flexneri*, respectively, invasion into host cells, and both act to nucleate actin in vitro.[2] Any search of the prior art and examination involving Group I therefore, will substantially co-extend with the search and examination of Group II. Thus, Group I may be searched and examined along with the Group II without undue burden on the Office.

Applicants further direct the Office's attention to MPEP §803.04, which states in regards to the burden of searching nucleotide sequences: "It has been determined that normally ten sequences constitute a reasonable number for examination purposes. Accordingly, in most cases, up to ten independent and distinct nucleotide sequences will be examined in a single application without restriction." In light of the foregoing,

[1] Specification at p. 12, ln. 14-16.
[2] As evidence of these similarities, applicants submit for the Office's consideration three journal articles listed in a supplemental Information Disclosure Statement filed simultaneously herewith.

applicants submit that the examination of two amino acid sequences that have structural and functional similarity does not impose a serious burden on the Office.

Subject to the foregoing traverse, Group II drawn to a method for the production of a purified recombinant invasion protein (IpaC) comprising the amino acid sequence of SEQ. ID. NO. 2 is elected for examination in this application.

Respectfully submitted,

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